

For the record, my name is Kendall Barbary. I am a seasonal commercial fisher in Egegik and have lived and worked in Alaska since 2004. Currently, I am a Masters of Environmental Science Candidate at the Yale School of Forestry and Environmental Studies in New Haven, CT. I offered public comment in Levelock Village in early June, and would like to follow up with additional information.

I would like to suggest a possible improvement in the EPA Watershed Assessment regarding reservoir and mine induced seismicity. I am appreciative of the efforts of the EPA in giving some credence to the risk of induced seismicity in Chapter 4, yet I would like to see the addition of a few current resources on the subject. There is more recent data available that addresses the relationship between mining and tailings impoundments, and induced or triggered seismic activity (McGarr, Simpson, and Seeber 2002, in addition to the other resources listed below, has beneficial information as well as additional references worth considering).

Mining, mine-pit dewatering, and tailings storage may increase pore pressure, plate lubrication, tectonic stress and fault slip around a mine site. Even at low magnitudes, induced or triggered earthquakes could lead to increased liquifraction, tailings pond failure, leaching from tailings impoundments, and chronic contamination of Bristol Bay waters.

Considering the potential combined size of the tailings impoundments and mining operations at the proposed Pebble Mine, the shift in water balance across the landscape could have serious implications for the tectonic stability of the mine and the surrounding region. Although the Lake Clark Fault itself is considered inactive (according to the PLP 2011 EBD), and the precise terminus of the fault line is unknown, a 2002 study suggests that triggered earthquakes are just “as likely in stable as in active tectonic settings” (McGarr 2002 p659). No studies address the compounded impacts of a vast mining district on induced seismicity, and vice versa.

Though Bristol Bay communities might not be at direct risk in the event of induced seismicity, such an event may increase the probability of tailings impoundment failure that could have lasting degrading impacts on the surrounding ecosystem (Chambers and Higman 2011) and the communities who rely upon the vitality of the regions renewable resources for income and subsistence. The risks of triggered or induced seismicity must be considered alongside other seismic data and I encourage the EPA to add to the existing report with a more thorough assessment of the associated risks.

Mining, mine-pit dewatering, and tailings storage all stand to alter hydrologic regimes, pore pressure, plate lubrication, and tectonic stress around a mine site. Both mining and reservoirs, including open-pit mining and tailings impoundments, are linked to induced seismicity—in which these circumstances speed up or induce the occurrence of an impending earthquake—as well as triggered seismicity—wherein such activity triggers earthquakes in areas otherwise not associated with seismic activity. Cases of reservoir-induced seismicity have had devastating impacts, including the loss of lives and livelihoods and the impairment of ecosystems and waterways (see LaFraniere 2009 and McGarr, Simpson, Seeber 2002). Although the Lake Clark Fault itself is considered inactive (according to the PLP 2011 EBD), a 2002 study suggests that earthquakes can be triggered by minute stress changes and triggered earthquakes are just “as likely in stable as in active tectonic settings” (McGarr 2002 p659).

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